

Claims

1. A microarray for detecting the presence of one or more analytes in a sample, the microarray comprising:

a substrate defining a support surface;

a plurality of microspheres randomly distributed on the support surface,

each microsphere comprising:

a solid support having an exterior surface;

a color-based address comprising one or more dyes contained within the solid support and adapted to identify an individual microsphere; and,

an analyte-binding entity attached to the exterior surface which binds one of said analytes.

2. A microarray in accordance with claim 1, wherein the solid support comprises a member selected from the group consisting of polystyrene, nylon, and glass.

3. A microarray in accordance with claim 1, wherein the one or more dyes comprises a plurality of dyes, each dye of the plurality of dyes capable of absorbing light at a wavelength distinct from wavelengths at which all other dyes in the plurality of dyes are capable of absorbing light.

4. A microarray in accordance with claim 3, wherein the plurality of dyes comprises four dyes.

5. A microarray in accordance with claim 1, further comprising a cover disposed on the substrate above the plurality of microspheres.

6. A microarray in accordance with claim 1, wherein the plurality of microspheres includes a first microsphere distinguishable from at least a second microsphere based upon the color-based address.

7. A microarray in accordance with claim 1, wherein the plurality of microspheres includes a first microsphere distinguishable from all other microspheres in the plurality of microspheres based upon the color-based address.

8. A microarray in accordance with claim 1, wherein the support surface defines a plurality of wells.

9. A microarray in accordance with claim 8, wherein each well in the plurality of wells is adapted to receive only a single microsphere from the plurality of microspheres.

10. A microarray in accordance with claim 1, wherein the support surface defines a recess adapted to receive at least two microspheres of the plurality of microspheres.

11. A microarray in accordance with claim 10, wherein the recess is adapted to receive all microspheres in the plurality of microspheres.

12. A microarray in accordance with claim 1, wherein the support surface defines a channel.

13. A microarray in accordance with claim 12, wherein the substrate has first and second edges and wherein the channel extends from the first edge to the second edge.

14. A microarray in accordance with claim 13, wherein the channel extends from the first edge to the second edge along a non-linear path.

15. A microarray in accordance with claim 12, wherein the channel has a width sufficient to accommodate only a single microsphere from the plurality of microspheres.

16. A microarray in accordance with claim 12, wherein the channel includes channel walls, and wherein the channel walls have a height that is greater than the height of the microspheres.

17. A microarray in accordance with claim 16, wherein the plurality of microspheres is disposed in the channel; and further comprising a cover disposed on the substrate above the plurality of microspheres.

18. A microarray for detecting the presence of one or more analytes in a sample, the microarray comprising:

a plurality of microspheres randomly distributed on a support surface;
 wherein each microsphere of the plurality of microspheres includes an
 analyte binding entity which binds one of said analytes and a color-based address.

19. A microarray in accordance with claim 18, wherein the color-based
 address comprises a plurality of dyes, each dye of the plurality of dyes capable of
 absorbing light at a wavelength distinct from wavelengths at which all other dyes in
 the plurality of dyes are capable of absorbing light.

20. A method of detecting one or more analytes in a sample, comprising:
 providing a plurality of microspheres, each microsphere comprising a
 solid support having an exterior surface, a color-based address, and an analyte-
 binding entity attached to the exterior surface which binds one of said analytes;
 exposing the plurality of microspheres to said sample;
 randomly distributing the plurality of microspheres onto a substrate;
 detecting indications of binding between said analytes and the analyte-
 binding entities on the plurality of microspheres;
 associating each indication of binding with the location on the substrate
 of the analyte-binding entity to which said analyte has bound;
 determining the color-based address of the microsphere at the location
 of each indication of binding; and
 correlating each indication of binding with the color-based address
 based upon the location.

21. A method of fabricating a microarray for detecting the presence of one or more analytes present in a sample, the method comprising:

providing a plurality of microspheres, each microsphere comprising a solid support having an exterior surface and a color-based address;

attaching an analyte-binding entity capable of binding one of said analytes to the exterior surface of at least one of the microspheres in the plurality of microspheres; and

randomly distributing the plurality of microspheres onto a substrate.